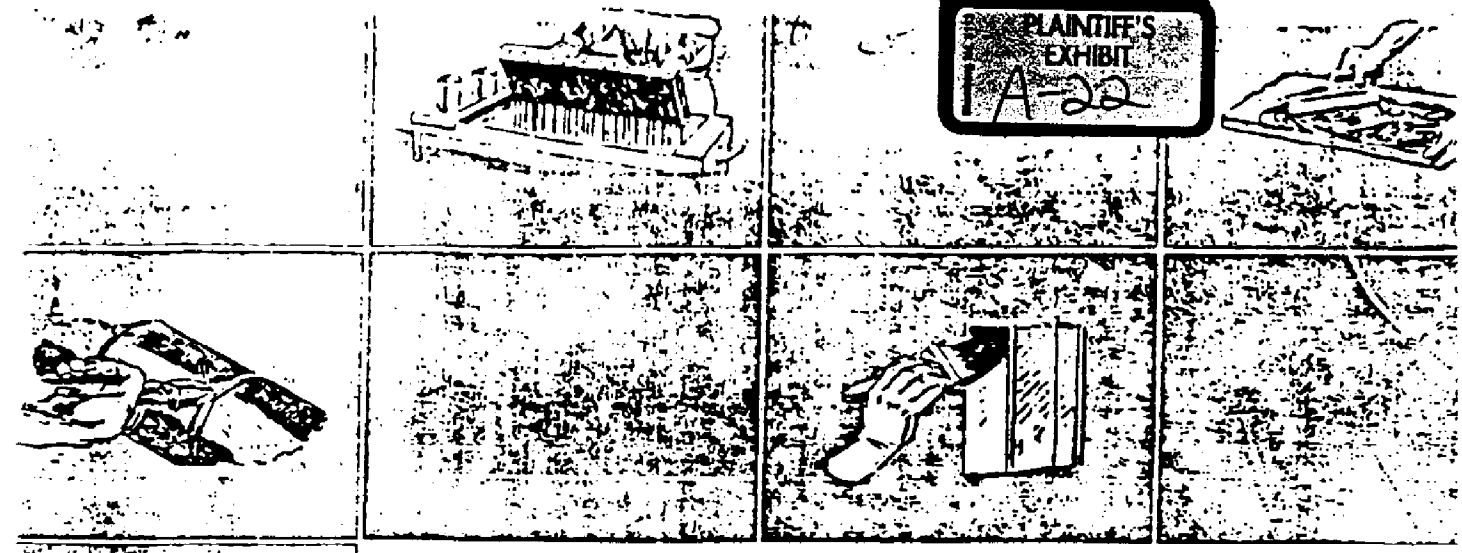
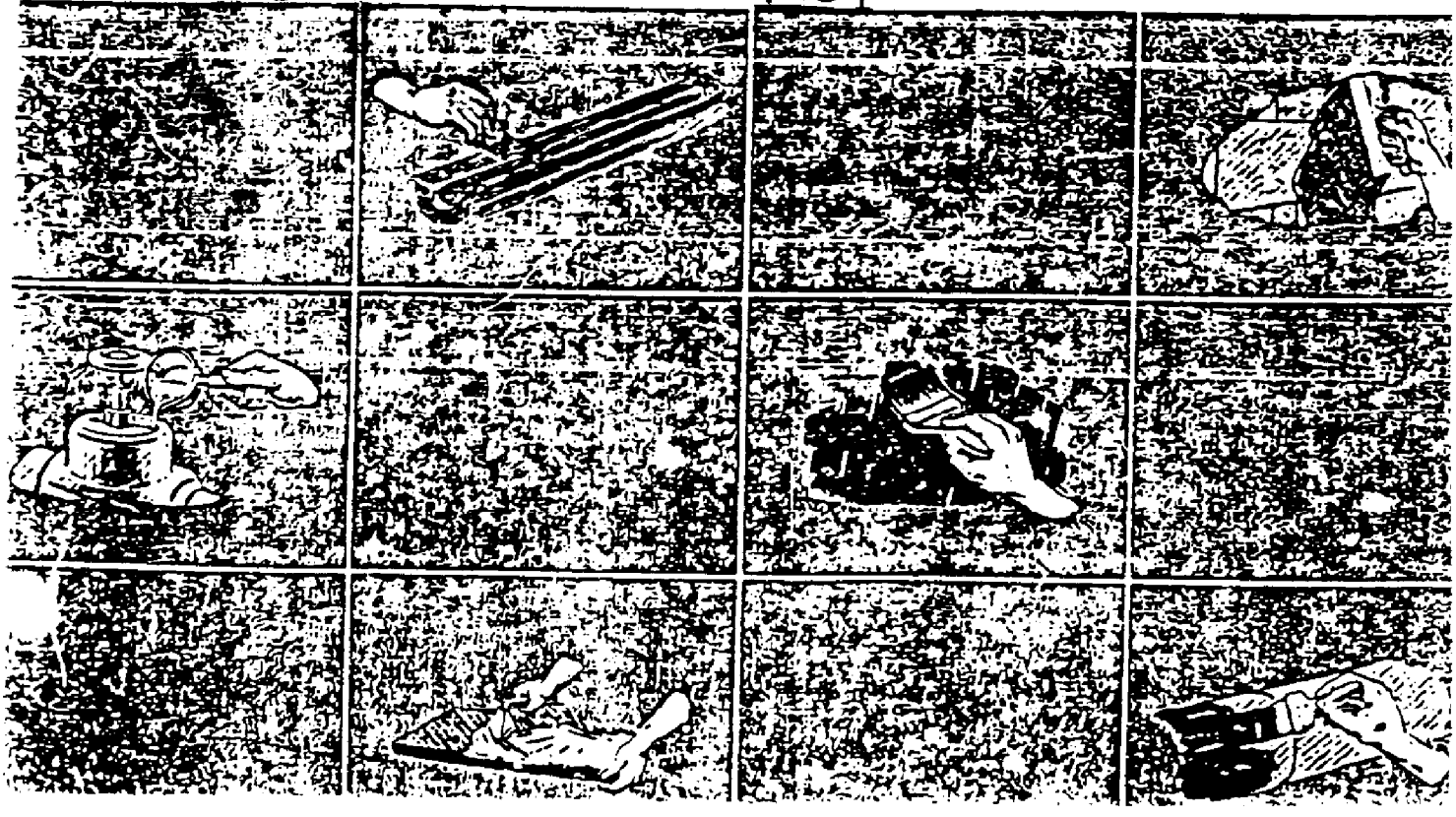


ARMSTRONG'S INSULATION SUNDRIES

ARMSTRONG CORK COMPANY
BUILDING MATERIALS DIVISION
LANCASTER PENNSYLVANIA

1951



The Importance of Proper Sundries In Cold Room Construction

On the average low-temperature insulation job, the sundry items represent a very small percentage of the allover cost figure. Yet, they are just as important to the life and efficiency of the installation as are the insulating materials chosen and the skill of the workmen who install them. Actually, the sundry materials used can mean the difference between good and poor cold room performance.

That's because sundries have three important tasks to perform. They must seal moisture out of the insulating material, hold it firmly in place, and provide a neat and practical finish. Sundries that do these three things well will keep refrigeration and maintenance costs low and add years to the life of insulated construction.

One of the most important jobs sundries must do is protect the insulation against vapor. Let's see why. Unseen moisture is always present in air in the form of vapor. That moisture is actually part of the air; it can go anywhere that air can go. No building materials in common use today are absolutely impervious to penetration by air and the moisture it contains.

Airborne moisture is driven through building walls by three factors: wind pressure, vapor pressure, and stack effect. The most powerful of these forces is wind pressure. Here's how it works.

Wind Pressure

A 30-mile-an-hour wind blowing against a 13" thick brick wall will drive 21 cubic feet of air an hour through every square foot of wall surface. With an outside temperature of 80° F. and a relative humidity of 70%, 18 gallons of water would be forced through 200 square feet of wall surface every 24 hours.

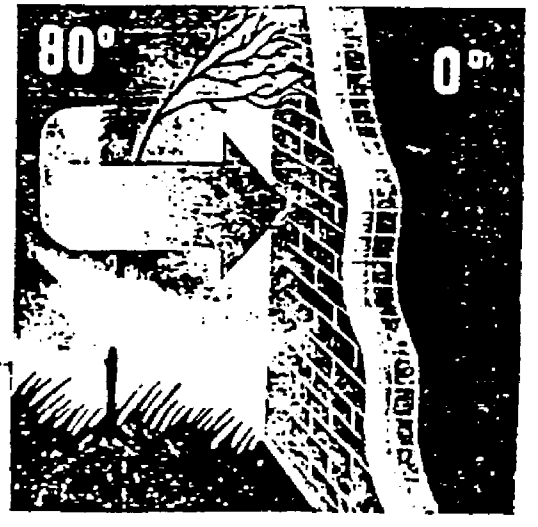
Vapor Pressure

Even when the wind isn't blowing, plenty of moisture will get through the walls of a low-temperature room. When the temperature inside the room is lowered, the air is chilled and moisture condenses out of it. The warm air outside then contains more moisture than the air in the room. This difference sets up a natural force called vapor pressure, which pushes vapor right through the construction.

Stack Effect

Lowering the temperature inside a room also sets up a movement of warm outside air toward cold inside air. When this warm air has worked its way through the wall, it is cooled and falls toward the floor. As it is cooled, the air loses volume, or shrinks. The downward movement of the air, combined with its shrinking, causes a partial vacuum at the top of the room. Warm air pushes in to overcome the vacuum and a constant current develops, bringing still more moisture through the wall. This is a stack effect. When the inside of the wall is lined with an insulating material and low temperatures are held within

Airborne moisture is driven through building walls by WIND PRESSURE.



the room, dew point also enters the picture. This is the point where the incoming air is cooled to the extent that moisture in that air condenses and is left behind in the form of water. Almost invariably, this point is somewhere within the insulation itself. If the insulation absorbs water, it soon loses its efficiency, for water is a good conductor of heat. If temperatures are low enough to turn the condensation to ice, the pressures set up can lift a concrete floor, or buckle an insulated wall. Then the whole job must be torn out and the room re-insulated.

Preventing Moisture Damage

The first step in preventing this costly damage is to seal the inner side of the building wall against air and moisture passage. That's a job for a good asphaltic priming paint, applied after masonry walls have been made even with portland cement back plaster.

To do a good sealing job, the paint used must hold up for many years and resist cracking and deterioration as it ages. It must not slip or sag, for sun temperatures on building walls can go as high as 150° F., and temperatures well over 100° F. can then develop at the paint film. An inferior quality asphaltic paint cannot be relied upon for satisfactory service under these severe conditions.

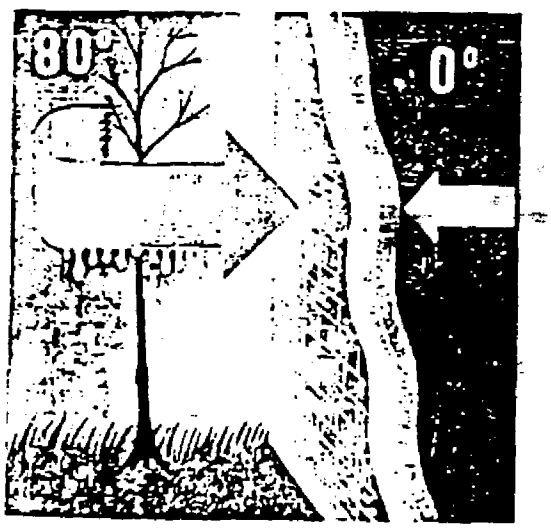
The most important sundry material used for holding the insulation securely in place is the hot asphalt in which it is applied. The bond between the priming paint and the asphalt is only as good as the asphalt used. It must be tough and strong and have a minimum susceptibility to temperature change. It must not be in itself subject to chemical change, and has to maintain these qualities for many years. The use of an inferior asphalt that slips or sags or loses its bonding properties can only result in needless expense for repair and maintenance.

The deteriorating effects of moisture must also be reckoned with in the wooden skewers used to hold layers of insulation together, and the nails that anchor the material to wooden construction. Wooden skewers must be chemically treated to resist rot and fungus growth, and nails galvanized to prevent rusting. The use of any other type lessens the allover efficiency of the low-temperature insulation job.

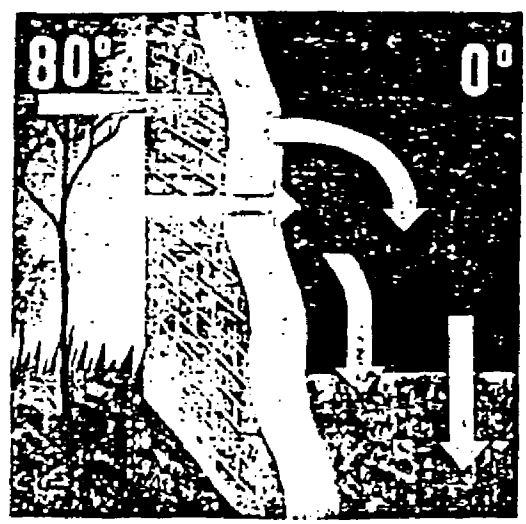
Sundries used for finishing low-temperature insulation also must possess certain qualities if they are to perform well. Asphalt emulsions used for interior room finishes, for example, should be clay-type emulsions. This type permits the use of soft asphalts in formulation. These asphalts will give flexibility to the finish, and the clay will provide the strength needed to eliminate flowing of the finish, either hot or cold. Clay-type emulsions also are stable and will not rub off when they are wet.

In addition to sundries needed in the applications described here, Armstrong makes many other sundry items for every phase of low-temperature work. Each one is formulated to withstand the severe conditions found in low-temperature construction. They are the result of years of experiment and research in the most efficient methods of installing insulation. Each product has been specially developed for the phase of the job where its use is recommended.

Airborne moisture is driven through building walls by VAPOR PRESSURE.



Airborne moisture is driven through building walls by STACK EFFECT.



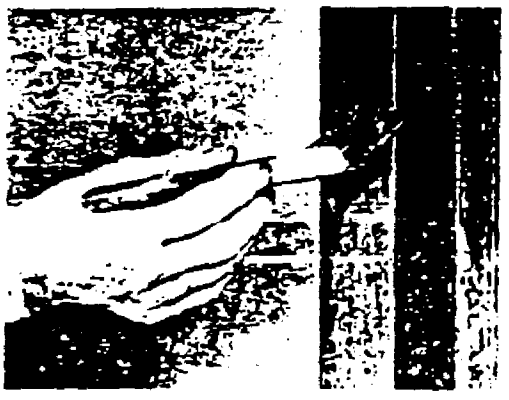
3

Armstrong's Erection Materials

No. 3 Asphaltic Priming Paint—This paint has been specially developed for priming masonry, concrete, or portland cement plaster surfaces prior to the erection of insulation in hot asphalt or cold erection plastic. No. 3 Paint penetrates the pores of the surface to which it is applied and forms a tough film which helps seal the wall against air and vapor penetration. It also provides a strong bond with the hot asphalt or cold erection plastic which follows. This paint will not slip or sag at high temperatures or crack and peel at low temperatures. It becomes stronger with age. No. 3 Paint should not be used as a finishing material.

Coverage—100 sq. ft. per gallon sprayed on in two coats. 75 sq. ft. per gallon brushed on in one coat.

Packaging—1- and 5-gallon pails and 30- and 55-gallon drums. Weight of No. 3 Paint is 8½ lbs. per gallon.



No. 4 Asphaltic Priming Paint—This paint is required fo priming steel or other metal surfaces before application o low-temperature insulation in either hot asphalt, cold erec tion plastic, or adhesives. It greatly strengthens the bond between these agents and the metal surface, and at the same time prevents corrosion and rusting of the metal. No. 4 Asphaltic Paint forms a strong, long-lasting film which has extremely high resistance to moisture as well as acids, alkalis, and chemical fumes.

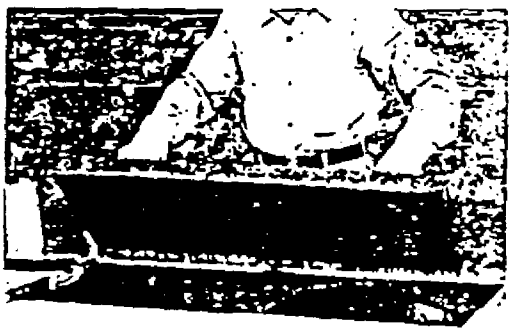
Coverage—Approximately 150 sq. ft. per gallon.

Packaging—1- and 5-gallon cans and 30- and 55-gallon drums. Weight of No. 4 Paint is 9 lbs. per gallon.

Erection Asphalt—This is a 180° to 200° F. melting point, oxidized asphalt specially formulated for erecting Armstrong's Corkboard to walls, floors, ceilings, ducts, columns, and other applications. The asphalt is odorless, is not subject to chemical change, resists cracking or softening under extreme temperature variations, and maintains these desirable qualities for many years. It furnishes a tough, lasting bond between the insulation and the primed wall, and helps seal out air and moisture.

Coverage—Four-tenths of a pound of Armstrong's Erection Asphalt will cover approximately one sq. ft. of wall surface.

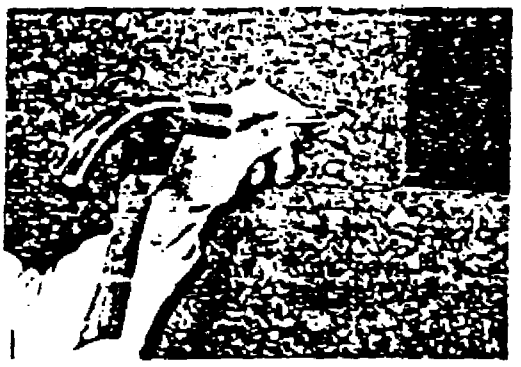
Packaging—450-lb. drums displacing about 8.6 cubic feet. Also packaged in 100-lb. paper wrapped rolls.



No. 340 Waterproof Cement—This is a medium body cement for erection of corkboard insulation against metal surfaces. It will also adhere tightly to concrete and plaster. No. 340 Cement is easy to work and possesses the high initial strength necessary to support the weight of the insulation without reinforcing. It remains plastic after drying and shrinks only slightly during the setting and drying period.

Coverage—30 sq. ft. per gallon, applied with a notched trowel.

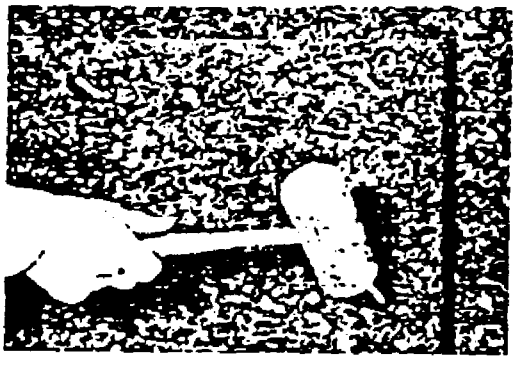
Packaging—1- and 5-gallon cans. Weighs 12½ lbs. per gal.



Galvanized Nails—These hot-galvanized nails, with ½" diameter heads and thin shanks, are used to secure the first layer of insulation against wood surfaces and for toe-nailing the first layer in partitions of solid corkboard. Two nails should be used per square foot of wall, three per square foot of ceilings. They are available in the following sizes: 3" x No. 9, 4" x No. 9, 5½" x No. 8, and 7½" x No. 8.

Insulating Paper—This is a black paper saturated and coated with pure asphalt. It is used as a vapor seal when erecting insulation against wood and frame construction. In application, joints should be lapped not less than 3".

Packaging—36" wide rolls, each containing 500 sq. ft. Weight of this asphalt-coated insulating paper is 38 lbs. per roll.

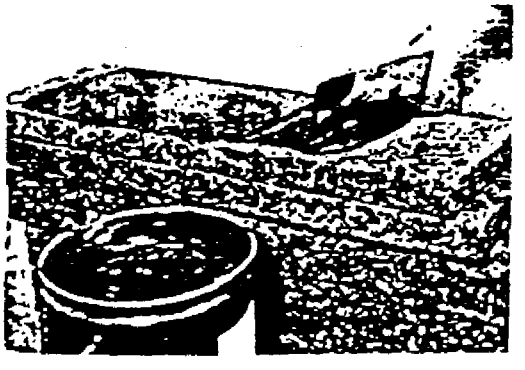


Hardwood Skewers—These hardwood skewers are specially treated with an odorless preservative to prevent mold growth and dry rot. They are used to secure the second and succeeding layers of corkboard to the preceding layer. Use two skewers per square foot for wall insulation and partitions of solid insulation, three per square foot for ceilings. Skewers are 4½", 5½", and 7" in length—¼" in diameter.

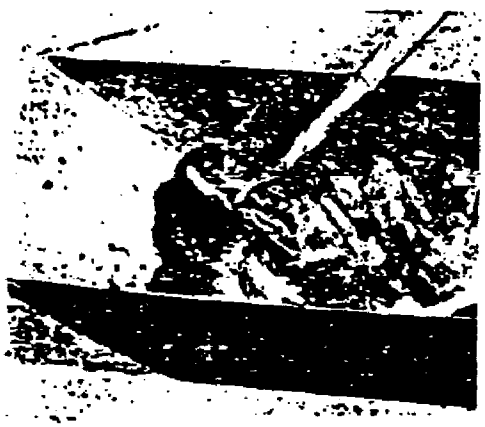
Cold Erection Plastic—This material is used for erecting low-temperature insulation where the use of hot asphalt is impractical or dangerous. It is made with erection asphalt, dissolved in a solvent and mixed with a filler. This plastic should not be used where the solvent odor might taint foodstuffs or where ventilation during application is poor.

Coverage—25 sq. ft. per gallon in a coat 1/16" thick.

Packaging—1- and 5-gallon cans and 30- and 55-gallon drums. Weight of this product is 11½ lbs. per gallon.



Armstrong's Finishing Materials



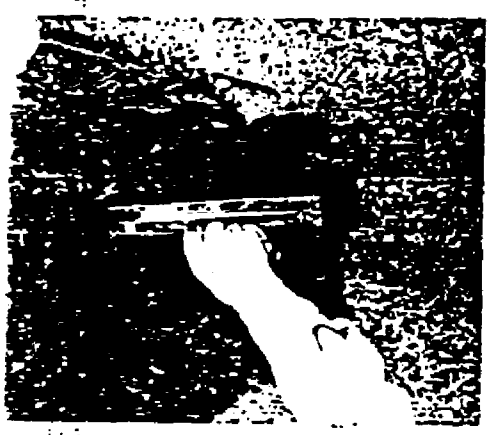
Asphalt Emulsion—This material is the basic ingredient for Armstrong's Plastic Emulsion Finish. This is a durable, moisture-resistant finish for corkboard insulation. Asphalt Emulsion is a clay emulsion of high-grade, finely dispersed asphalt which, when mixed according to the following formula, can be troweled directly onto the surface of the insulating material. Mix as follows:

50 gallons Armstrong's Asphalt Emulsion
112 lbs. asbestos fibers
275 lbs. (2¾ cu. ft.) dry, screened sand
15 gallons clean water

Where a sand finish on the interior of the cold room is desired, this mixture may be used for both first and second coats.

Coverage—15 sq. ft. for each gallon of Armstrong's Asphalt Emulsion, when applied in two coats to a final thickness of ⅛" when dry.

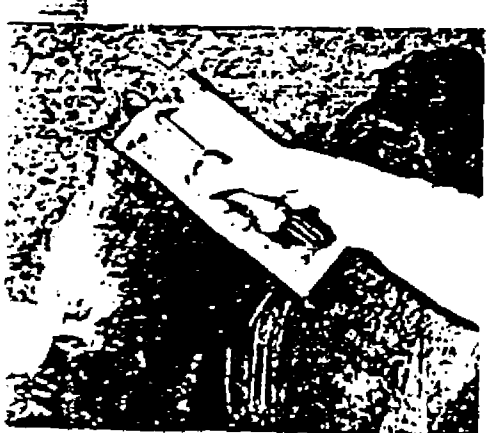
Packaging—Armstrong's Asphalt Emulsion is packaged in 1- and 5-gallon cans and 30- and 55-gallon drums. It weighs 9½ lbs. per gallon.



Plastic Emulsion—This product is a complete asphalt plastic finish ready for application as received. It is a mixture of Armstrong's Asphalt Emulsion, asbestos fibers, sand, and water. Plastic Emulsion is troweled directly to the insulation surface in two coats.

Coverage—8 sq. ft. per gallon for a two-coat surface.

Packaging—1- and 5-gallon cans and 30- and 55-gallon drums. Plastic Emulsion weighs 11 lbs. per gallon.



S. P. Emulsion—This is a factory-mixed combination of Armstrong's Asphalt Emulsion and asbestos fibers, ready for application to insulation surfaces. It is used when a smooth, plastic finish is desired. The emulsion is troweled on directly in two coats to a final thickness of approximately ⅛" when dry.

Armstrong's S. P. Emulsion may be mixed with sand when a sand finish is desired. Mix as follows:

50 gallons Armstrong's S. P. Emulsion
175 lbs. (1¾ cu. ft.) dry, screened sand
Water for tempering

This mixture should be troweled on the insulation surface in two coats.

Coverage—9 sq. ft. of two-coat surface for each gallon.

Packaging—1- and 5-gallon cans and 30- and 55-gallon drums. Weight of Armstrong's S. P. Emulsion is 10 lbs. per gallon.

NOTE: Armstrong's S. P., Plastic, and Asphalt Emulsions should not be applied when the temperature is below 40° F. Heat and fans should be provided if necessary to maintain this temperature until the finish is thoroughly dry. When dry, the finish can be subjected to temperatures as low as 25° below zero.

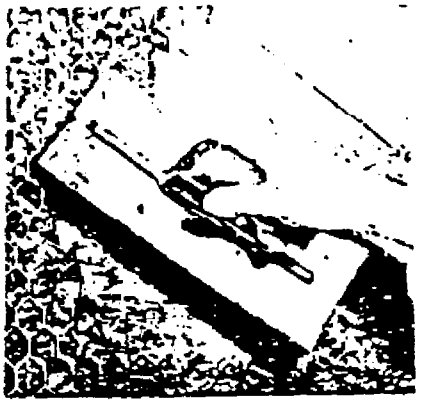
Insulmastic—Insulmastic is a factory-mixed combination of Armstrong's Asphalt Emulsion with special fibers and fillers. It is recommended for use where a fire-resistant finish is required. Applied in two coats, each approximately ⅛" thick, Insulmastic is an excellent finishing material for low-temperature insulation exposed to the weather. On high towers, spherical and cylindrical vessels, elevated lines, etc., galvanized wire mesh should be applied directly to the insulation before Insulmastic is troweled on.

Armstrong's Insulmastic possesses the tensile strength necessary to withstand normal movement without cracking or rupturing, is not affected by temperature changes, does not slip or sag at high temperatures, and bonds well with the corkboard insulation surfaces.

When Insulmastic is applied in two coats, each about ⅛" thick, it will dry to a final thickness of 3/16".

Coverage—In a two-coat finish, two pounds of Insulmastic will cover one square foot of insulation surface.

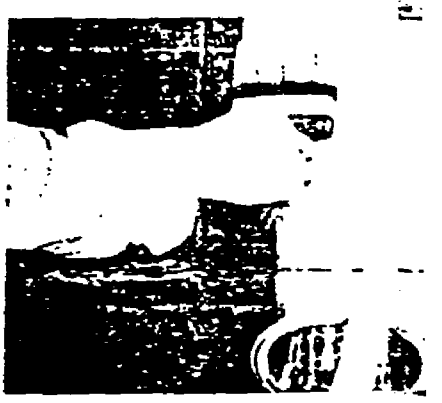
Packaging—50-, 300-, and 500-lb. drums. Weight is 10 lbs. per gallon.



Aluminum Cold Storage Paint—This paint provides a light-reflective finish for asphaltic surfaces. It does not discolor due to bleeding through of the asphalt, is odorless when dry, and does not crack at low temperatures. This Aluminum Cold Storage Paint should not be used on wood, metal, or any surfaces other than asphaltic ones. It is shipped as liquid and powder, packaged separately, which must be thoroughly mixed just prior to using.

Coverage—One gallon will cover 250 square feet in two coats.

Packaging—½-, 1-, and 5-gallon cans. It weighs 9 lbs. per gallon.

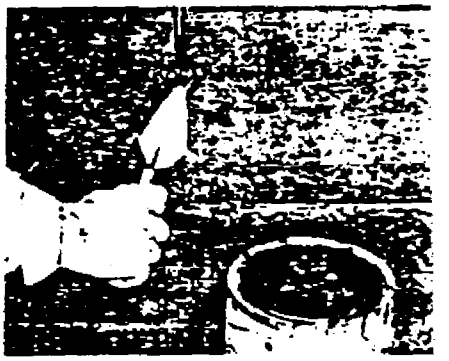


No. 27-B Seam Filler—This is an asphalt mastic compound designed to fill and seal the joints between pieces of Armstrong's Mastic Finish Corkboard. It has been specially developed to withstand the low temperature used in refrigerated construction.

It is applied with a pointing trowel and will not shrink out of joints.

Coverage—One gallon of No. 27-B Seam Filler is shipped as a sundry with every 150 square feet of Armstrong's Mastic Finish Corkboard.

Packaging—½-, 1-, and 5-gallon cans. Weight is 13½ lbs. per gallon.



Asbestos Floats—These floats are a special grade of asbestos fiber used for mixing with asphalt emulsion. They give a dense, tough, hard quality to the final asphalt plastic finish applied to walls of low-temperature rooms.

Packaging—Asbestos floats are packaged in 100-lb. bags.

Fine Regranulated Cork—This product consists of fine particles of Armstrong's Corkboard and is used wherever the application of cork in board form is impractical. Regranulated cork is principally used as a filler around tanks and vessels and in small and irregularly shaped spaces.

Fine regranulated cork has good insulating qualities, possesses the high natural moisture resistance inherent in all cork, and resists packing and settling. This material includes all baked cork particles that will pass through an 8-mesh screen.

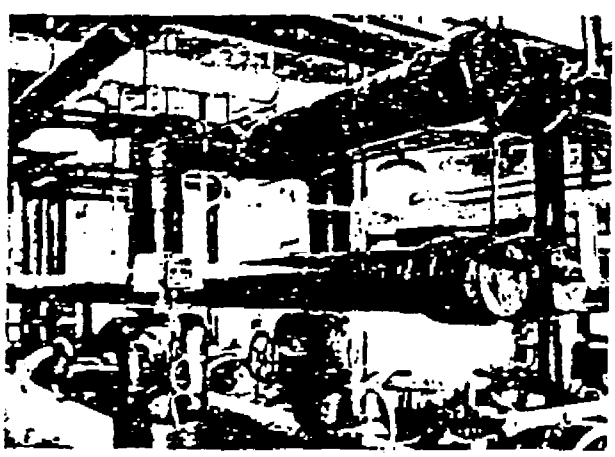
Packaging—Fine regranulated cork is packed in bags containing approximately 7 cu. ft. Weight is about 5 lbs. per cubic foot.

The Importance of Proper Sundries In Applying Cork Covering

Sundries that seal out moisture, hold the insulation firmly in place, and give it a neat, finished appearance are just as important for cold line insulation as they are for the insulation of low-temperature rooms. Any opening that allows air to work its way into the covering on cold lines is an invitation to trouble. As that air nears the pipe, it is cooled, the moisture condenses, and water is deposited in the insulating material. Water conducts heat, and the heat-retarding properties of the insulation decrease in direct proportion to the amount of water present. If the temperature in the line is low enough, the condensation will turn to frost. In time, the growth of ice crystals can break up the insulating material and cause complete loss of insulating efficiency.

A naturally moisture-resistant pipe insulation like Armstrong's Cork Covering will resist this damage far better than absorbent coverings. However, the performance of cork covering can be greatly improved if applied with the right sundries.

The adhesive used at the joints in the covering should be waterproof to seal out air and moisture. Copper-clad steel wire should be used to hold the sections firmly in place. This is a special wire drawn from a steel-cored copper billet. It combines the strength of steel with the corrosion resistance of copper. Regular copper wire is not satisfactory, because it will stretch and allow the covering to loosen. Steel or galvanized wire lacks the needed corrosion resistance.



The asphaltic paint used to finish cold line insulation must also have certain properties if it is to do its job properly. This paint is the final seal on the outer face of the insulation and should hold up with age if it is to keep air and moisture out. The paint should set to a tough, hard finish that will not slip or sag under heat. It should remain tough, and not dry out and crack and peel in a short time, as often happens with inferior type asphaltic paints.

All of the sundries recommended for use with Armstrong's Cork Covering have been formulated to make each cork covering installation last longer with less maintenance. Used properly, they will do just that.

No. 299 Waterproof Cement—This is a waterproof, alkali- and acid-resistant cement that is quick setting and strong. It should be applied only to the surface that will be immediately placed in contact with an adjoining surface. It is necessary to coat only one of two adjoining surfaces with No. 299 Waterproof Cement.

Coverage—35 sq. ft. per gallon for joint areas.

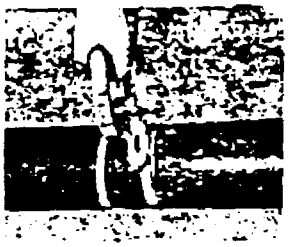
Packaging — 1- and 5-gallon cans. Weighs 12 lbs. per gallon.

Copper-Clad Steel Wire—This wire is used to hold the covering firmly in place on the line or fitting. It is a special copper-jacketed steel wire, drawn from a steel-cored copper billet and combines the strength of steel with the corrosion resistance of copper.

This wire is available in the following gauges and weights:

B and S Wire Gauge	Lbs. per Ft.
No. 14	.0015
No. 12	.0183
No. 10	.0291

Galvanized Bands and Seals—Galvanized bands and seals are substituted for wire at no extra cost for use in applying cork lagging and the larger sizes of cork covering. These straps and seals are double electro-galvanized to provide high resistance to corrosion. Tools for application of special seals are available on request.



For applications where corrosive or special atmospheric conditions exist, stainless steel or Monel strapping and seals should be substituted for galvanized.

Size of Galvanized Bands	Gauge	Lbs. per Ft.
½ x .015	25	.0256
½ x .020	25	.034
¾ x .020	25	.0526
¾ x .035	20	.0891

No. 27-B Seam Filler—This asphalt mastic compound is designed to fill and seal the joints between sections of pipe covering or fitting covers. It has been specially developed to withstand low temperatures. The proper quantity is supplied with all orders for cork covering.

Packaging—½-, 1-, and 5-gallon cans. Weighs 13½ lbs. per gallon.

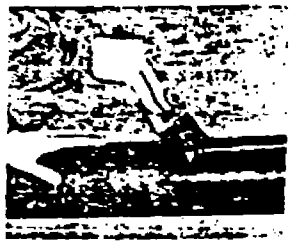
Fitting Filler—Armstrong offers two materials for use in sealing off joints and filling voids between fittings on cold lines and the cork fitting covers.

Armstrong's Fitting Filler is made by mixing molten paraffin wax and cork particles. This mixture is poured into fitting covers to eliminate all voids between fitting and cork cover. The amount of fitting filler necessary for correct application is shipped as a sundry with every shipment of cork covering.

Brine putty is a mixture of cork particles and special asphalts primarily used for filling voids and large joints before the application of Armstrong's No. 27-B Seal Filler.

Weight—Both products weigh 56 lbs. per cubic foot when mixed.

No. 1 Cork Covering Paint—This is a high-grade asphaltic paint that should not be confused with ordinary asphalt paint. After cork covering has been applied, this paint is used to provide a glossy black finish for the installation. Where any asphaltic surface is not exposed to weather, Armstrong's No. 1 Cork Covering Paint furnishes long-lasting protection against vapor infiltration. All cork pipe covering and all insulated tanks and equipment located indoors should receive a coat of this paint annually.



Coverage — 180 sq. ft. per gallon of brush coat.

Packaging — 1- and 5-gallon cans. Weighs 8½ lbs. per gallon.

Solvopruf—This is a solvent-proof finishing and adhesive material for use with corkboard or cork covering. Solvopruf® resists the deteriorating effects of benzol, toluol, methyl ethyl ketone, gasoline, and kerosene. It is recommended in place of asphaltic finishes where solvent resistance is required. Solvopruf is applied to bare cork surfaces with a brush or trowel. When set, it retains its plasticity at temperatures from 35° below zero to 125° F.

Coverage—50 sq. ft. per gallon over uncoated cork insulation as a finish. 100 sq. ft. per gallon as a primer or an adhesive.

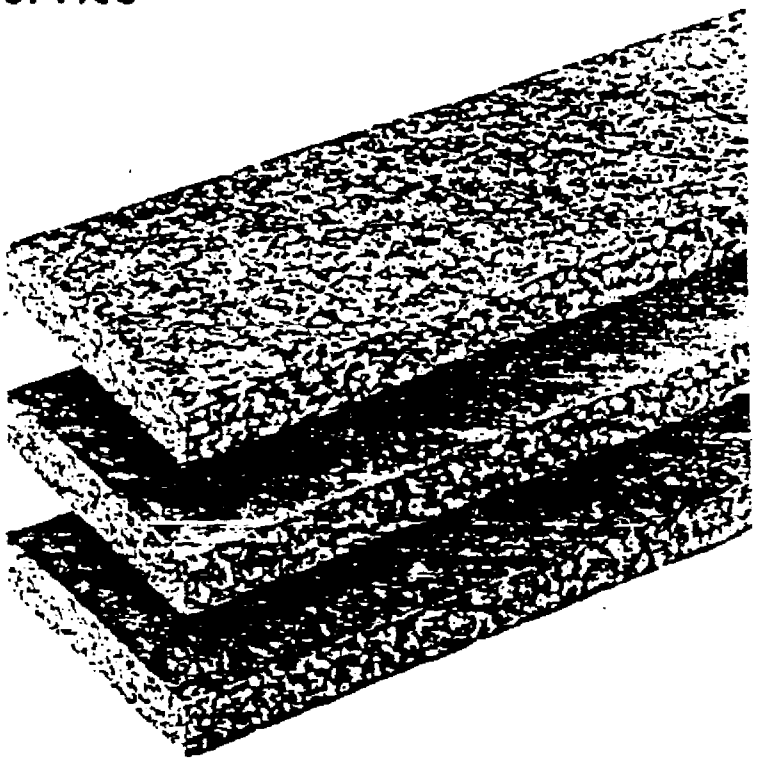
Packaging — Furnished in a unit consisting of a separate 5-gallon container of Mix A and five 6-oz. bottles of Mix B. One bottle of B is combined with one gallon of Mix A before applying.

CC Navy Sealer—This is a specially developed, fire-resistant vapor barrier used to coat both inner and outer faces of cork covering, and as the adhesive on all joints. When this sealer is used, and the covering is applied with copper-clad steel wire, the installation meets all requirements of Military Specification MIL-876A. Covering should be ordered unfinished, as CC Navy Sealer is applied to bare cork surfaces.

Coverage—35 square feet per gallon in a 1 16" thick coat.

Packaging — 1- and 5-gallon containers.

Armstrong's Cork Insulation and Armstrong's Contract Service



Armstrong's Corkboard is made of carefully sized granules of cork, compressed and baked into board form. Millions of tiny air cells in each granule serve as an effective barrier to the passage of heat. The unique cellular composition also seals moisture out because the tough walled cells fit together so perfectly that there is no space between them where it can collect.

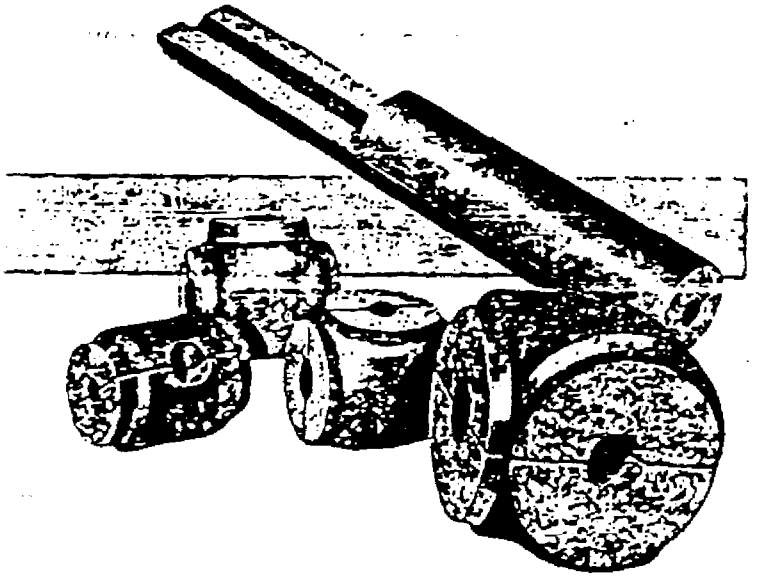
Corkboard is strong, tough, will not shrink, swell, or warp and is self-supporting to a height of 14'.

It is classified as a fire-retardant material.

In addition to Standard Corkboard, two other types are available for special service conditions. These are Armstrong's Super-Service Corkboard, coated with factory-applied asphalt on both faces, and Armstrong's Mastic-Finish Corkboard, which has a 1/8" asphalt mastic finish on one face.

Available Sizes: 12" x 36", 18" x 36", 24" x 36", 36" x 36"

Available Thicknesses: 1", 1½", 2", 3", 4", 6"



Armstrong's Cork Covering on cold lines prevents 80% to more than 90% of the refrigeration loss that would occur if the lines were left uninsulated. As a result, this material pays for itself in a few years. It also eliminates condensation and drip and the accompanying rusting and depreciation of cold lines located in warm areas.

Armstrong's Cork Covering has high insulating efficiency and high natural moisture resistance. It is made in exact sizes for easy application to pipes and fittings.

Fitting covers are made in the same thicknesses as pipe covering and are designed for all types of ells, tees, valves, flanges, unions, etc.

Cork covering is manufactured in three regular thicknesses, and in special thicknesses to meet different service conditions. All thicknesses are made to fit standard pipe and copper tubing from ¼" up and are furnished in 36" lengths.

ARMSTRONG'S CONTRACTING ORGANIZATION

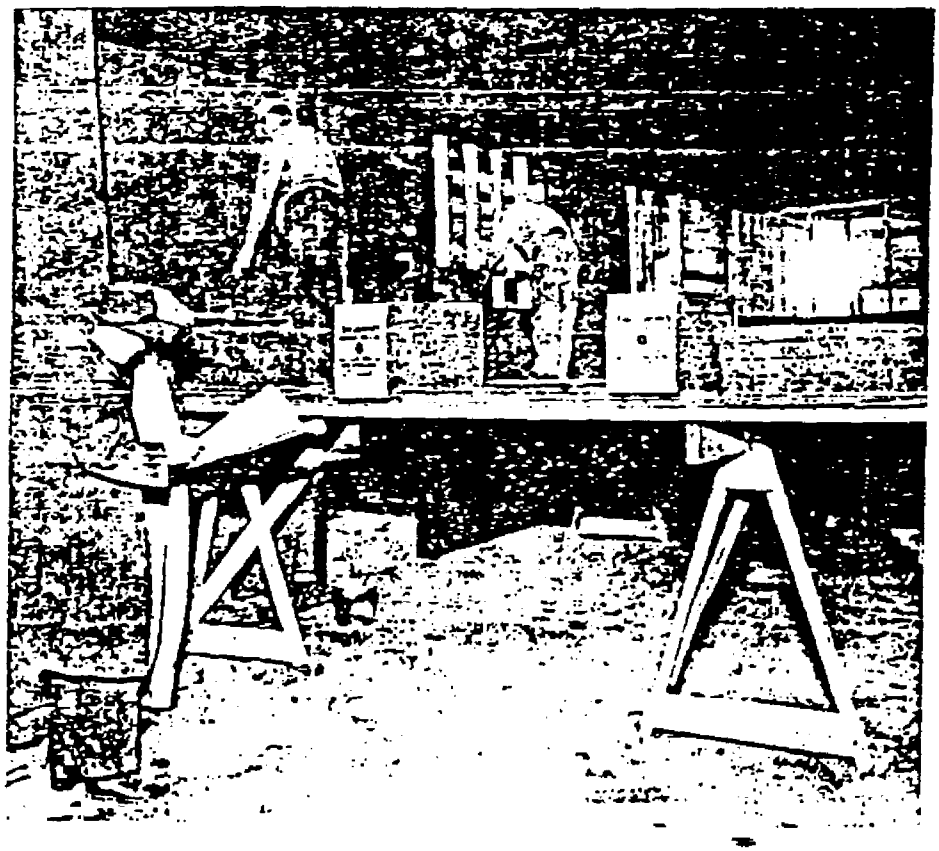
Armstrong is not only a manufacturer of industrial insulations but also a contractor for the application of these products, operating through 46 district and branch offices covering most of the large trading areas in the country.

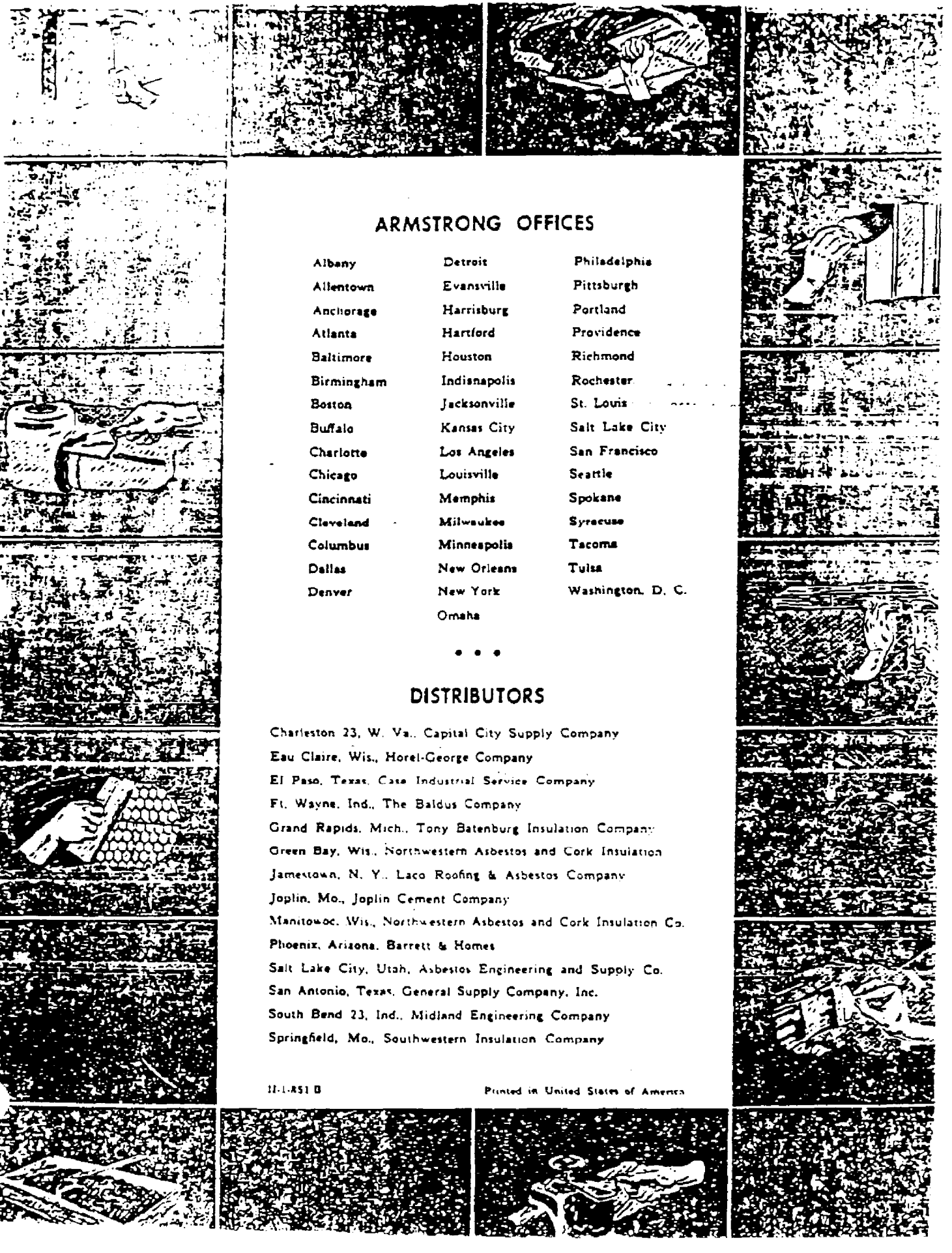
Our national organization can offer unusually efficient service to all types of insulation buyers. Take, for example, a large engineering company having home offices on the Atlantic Seaboard and buying insulation work along the Gulf Coast or in the Far West. Armstrong's well-knit organization can help the home office engineers develop plans and specifications. Then the actual installation can be carried out with complete understanding by another Armstrong office in the territory where the work is being done. Thus the engineering firm has the advantage of being able to work all over the country with a familiar organization. Paper work is handled in the same manner on every job so that misunderstandings are eliminated, communications are simplified, and costs are reduced.

Not only the large engineering company but also every other insulation buyer may feel free at any time to call upon the services of the trained engineers who staff each Armstrong district office. In addition to the engineering advice available through these field offices, the company maintains at the home offices a staff of engineers and research scientists whose job it is to work on the solution of especially difficult problems involving industrial insulations.

In the field, trained construction superintendents direct all contract installation in their areas. Working directly under these men are construction foremen whose responsibility it is to get the job done properly.

All of the people in the Armstrong Contracting Organization have been trained in the tradition of good workmanship. Our long experience in the insulation business has convinced us that even the best materials cannot perform at a high degree of efficiency year after year unless they are properly installed.





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